


FORM PTO-1390 (REV 10-95)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER
<b>TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. §371</b>			F7480(V)
			U.S. APPLICATION NO. (if known, see 37 CFR §1.5)
			<b>09/868944</b>
INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED	
PCT/EP99/09571	6 DECEMBER 1999	23 DECEMBER 1998	
TITLE OF INVENTION			
FORTIFICATION OF FOOD PRODUCTS WITH OLIVE FRUIT INGREDIENTS			
APPLICANT(S) FOR DO/EO/US			
VAN BUUREN, Jan, et al.			
<p><b>Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</b></p> <ol style="list-style-type: none"> <li><input checked="" type="checkbox"/> This is a <b>FIRST</b> submission of items concerning a filing under 35 U.S.C. §371.</li> <li><input type="checkbox"/> This is a <b>SECOND</b> or <b>SUBSEQUENT</b> submission of items concerning a filing under 35 U.S.C. §371.</li> <li><input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. §371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. §371(b) and PCT Articles 22 and 39(1).</li> <li><input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19<sup>th</sup> month from the earliest claimed priority date.</li> <li><input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. §371(c)(2))             <ol style="list-style-type: none"> <li><input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input checked="" type="checkbox"/> has been transmitted by the International Bureau.</li> <li><input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</li> </ol> </li> <li><input type="checkbox"/> A translation of the International Application into English (35 U.S.C. §371(c)(2)).</li> <li><input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. §371(c)(3))             <ol style="list-style-type: none"> <li><input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</li> <li><input checked="" type="checkbox"/> have been transmitted by the International Bureau.</li> <li><input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired.</li> <li><input type="checkbox"/> have not been made and will not be made.</li> </ol> </li> <li><input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. §371(c)(3)).</li> <li><input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. §371(c)(4)). — <i>Not attached</i></li> <li><input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. §371(c)(5)).</li> </ol> <p><b>Items 11. to 16. below concern document(s) or information included:</b></p> <ol style="list-style-type: none"> <li><input type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. §§1.97 and 1.98.</li> <li><input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. §§3.28 and 3.31 is included.</li> <li><input checked="" type="checkbox"/> A FIRST preliminary amendment.              <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.           </li> <li><input type="checkbox"/> A substitute specification.</li> <li><input type="checkbox"/> A change of power of attorney and/or address letter.</li> <li><input type="checkbox"/> Other items or information:</li> </ol>			

U.S. APPLICATION NO. <b>09/868944</b>		INTERNATIONAL APPLICATION NO. <b>PCT/EP99/09571</b>		ATTORNEY'S DOCKET NUMBER <b>F7480(V)</b>	
17. <input checked="" type="checkbox"/> The following fees are submitted: <b>BASIC NATIONAL FEE ( 37 CFR §1.492 (a) (1) - (5)):</b> Search Report has been prepared by the EPO or JPO..... \$860.00 International preliminary examination fee paid to USPTO (37 CFR §1.482)..... \$690.00 No international preliminary examination fee paid to USPTO (37 CFR §1.482) but international search fee paid to USPTO (37 CFR §1.445(a)(2))..... \$710.00 Neither international preliminary examination fee (37 CFR §1.482) nor international search fee (37 CFR §1.445(a)(2)) paid to USPTO..... \$1000.00 International preliminary examination fee paid to USPTO (37 CFR §1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)..... \$100.00  <div style="text-align: right;"><b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b></div>				<b>CALCULATIONS</b> PTO USE ONLY	
Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 C.F.R. §1.492(e)). <input type="checkbox"/> 20 <input type="checkbox"/> 30					
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total claims	11 - 20 =	0	x \$ 18.00	\$0.00	
Independent claims	2 - 3 =	0	x \$ 80.00	\$0.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$ 270.00		
<b>TOTAL OF ABOVE CALCULATIONS =</b>				<b>\$860.00</b>	
Reduction of 1/2 for filing by small entity, if applicable. A Verified Small Entity Statement must also be filed (Note 37 C.F.R. §§1.9, 1.27, 1.28).					
<b>SUBTOTAL =</b>				<b>\$860.00</b>	
Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 C.F.R. §1.492(f)). <input type="checkbox"/> 20 <input type="checkbox"/> 30					
<b>TOTAL NATIONAL FEE =</b>				<b>\$860.00</b>	
Fee for recording the enclosed assignment (37 C.F.R. §1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. §§3.28, 3.31). \$40.00 per property.					
<b>TOTAL FEES ENCLOSED =</b>				<b>\$860.00</b>	
				Amount to be refunded:	
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a. <input type="checkbox"/> A check in the amount of _____ to cover the above fees is enclosed. b. <input checked="" type="checkbox"/> Please charge my Deposit Account No. <u>12-1155</u> in the amount of <u>\$860.00</u> to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>12-1155</u> . A duplicate copy of this sheet is enclosed.					
<b>NOTE: Where an appropriate time limit under 37 C.F.R. §§1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. §1.137(a) or (b)) must be filed and granted to restore the application to pending status.</b>					
SEND ALL CORRESPONDENCE TO:					
Ms. Linda Horvath UNUS Patent Department 45 River Road Edgewater, NJ 07020 USA					
 SIGNATURE <i>Reg # 32,004</i> <b>Anthony J. Zelano</b> REPRESENTATIVE CAPACITY FOR UNILEVER					
27,969 REGISTRATION NUMBER					
Filed: 21 JUNE 2001 AJZ:jmm					

**IN THE UNITED STATES DESIGNATED/ELECTED OFFICE**

International Application No. : PCT/EP99/09571  
International Filing Date : 6 DECEMBER 1999  
Priority Date(s) Claimed : 23 DECEMBER 1998  
Applicant(s) (DO/EO/US) : VAN BUUREN, Jan, et al.

Title: FORTIFICATION OF FOOD PRODUCTS WITH OLIVE FRUIT INGREDIENTS

**PRELIMINARY AMENDMENT**

Commissioner for Patents  
Washington, D.C. 20231

SIR:

The claims of the above application were amended under Article 34 and this Preliminary Amendment is based thereon.

Prior to calculating the national fee, and prior to examination in the National Phase of the above-identified International application, please amend as follows:

**IN THE CLAIMS:**

6. (Amended) Method according to claim 4, whereby the obtained food product contains at least 10 ppm of olive derived phenolic compounds.
7. (Amended) Method according to claim 4, whereby the food product is a vegetable oil, preferably an olive oil.
8. (Amended) Method according to claim 4, whereby the olive solid matter is allowed to soak in the oil for at least one minute and then is separated from the oil.
9. (Amended) Method according to claim 4, whereby the food product is chosen from a group consisting of a spread, a salad dressing, mayonnaise or a sauce.
10. (Amended) Food product obtainable by the method according to claim 4.

11. (Amended) Food product prepared with the oil obtainable by the method according to claim 7.

REMARKS

The purpose of this Preliminary Amendment is to eliminate multiple dependent claims in order to avoid the additional fee. Applicants reserve the right to reintroduce claims to canceled combined subject matter.

Respectfully submitted,

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AJZ:jmm

VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 6-11 have been amended as follows:

6. (Amended) Method according to claims 4 ~~or~~ 5, whereby the obtained food product contains at least 10 ppm of olive derived phenolic compounds.
7. (Amended) Method according to ~~any one of~~ claims 4-6, whereby the food product is a vegetable oil, preferably an olive oil.
8. (Amended) Method according to claim ~~8~~4, whereby the olive solid matter is allowed to soak in the oil for at least one minute and then is separated from the oil.
9. (Amended) Method according to ~~any one of~~ claims 4-6, whereby the food product is chosen from a group consisting of a spread, a salad dressing, mayonnaise or a sauce.
10. (Amended) Food product obtainable by the method according to ~~any one of~~ claims 4-9.
11. (Amended) Food product prepared with the oil obtainable by the method according to claims 7 ~~or~~ 8.

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**FORTIFICATION OF FOOD PRODUCTS WITH OLIVE FRUIT**  
**INGREDIENTS**

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The present invention relates to a method of fortifying food products with olive fruit ingredients. According to this method solid matter derived from olive fruit is added to food products, which results in an increase of the level of anti-oxidants, particularly of olive polyphenols.

**BACKGROUND OF THE INVENTION**

20 The incidence of cardiovascular diseases in a population is correlated with the occurrence of a high blood cholesterol content. The blood cholesterol level has been found to be decreased by a diet, which contains specific food components. For example, it is recommended to eat fats with a high content of unsaturated fatty acids.

It is known further that particularly diets which contain olive oil are healthy, because olive oil consumption contributes to a good balance of HDL cholesterol and LDL cholesterol in the blood. Recently it has been found that some minor fat components particularly the anti-oxidants, including polyphenols from fat, positively interfere with the body's cardiovascular system, particularly because they are

believed to help control oxidation of blood cholesterol. Non-refined olive oil has a high content of phenolic compounds which often are denoted as phenolics, polyphenols or, specifically, as olive  
5 phenolics or as olive polyphenols

Copending WO 99/32589 describes a useful application of said finding. The invention relates to spreads which contain olive oil as well as phenolic compounds.

- 10 Traditionally for spread preparation an olive oil is employed which has been fully refined. The refining has removed together with the impurities also the beneficial phenolic compounds. Said patent application describes a refining process which is so mild that it  
15 delivers a purified oil from which undesired olive oil odour and most of the free fatty acids have been removed, but which still contains a considerable amount of healthy phenolic compounds.
- 20 The phenolics derived from olives form a group of chemical compounds, some of which have a relatively high oil solubility, the lipophilic olive phenolics, while others are more soluble in water, the hydrophilic olive phenolics. Only recently attention is given to  
25 the nutritional benefits of the hydrophilic polyphenols.

When olive oil is contacted with a water phase, e.g. during the usual water washing step, a partitioning of  
30 phenolic compounds occurs. A great part of the phenolic compounds is so hydrophilic that they easily migrate to the water phase, while the major part of the lipophilic phenolic compounds stay in the oil phase.



At least a part of the bitter taste of olive oil is ascribed to phenolic compounds. The lipophilic phenolic compounds which occur in the olive oil most contribute to the bitter taste.

5

In co-pending patent applications EP 849353 and EP 933419 olive oil processes are described, which aim at debittering the olive oil by removing and/or hydrolysing lipophilic phenolic compounds in olive oil.

- 10 By hydrolysis the bitter lipophilic phenolic compounds are converted into the less bitter and more water soluble phenolic compounds. Since most of these migrate to the water phase of the olive oil/water mixture, they are removed when the separated water phase is  
15 discarded.

A characteristic sensoric property of many non-refined olive oils is astringency. The astringency is perceived as a non-pleasant feeling lingering in the back of the  
20 throat after some oil has been ingested. Excessive astringency, like excessive bitterness, spoils the taste of the oil. Astringency in olive oil appears to increase with its content of polyphenols.

- 25 WO 97/06697 teaches a healthy diet consisting of food products which have been fortified with high amounts of anti-oxidants, including phenolic compounds.

According to JP 59213368 (Derwent abstract) a tasty  
30 spread or cream is obtained by adding finely ground olives to food containing a fat-rich food ingredient. Because of the known astringent and bitter taste of olives, the olives are used only after a debittering treatment with sodium hydroxide solution.

It is known that after a sodium hydroxide treatment olives are substantially depleted with polyphenols. Therefore said process is not suited to enhance the content of phenolic compounds in a food product.

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The aim of the present invention is to enhance the nutritional value of a food product by the addition of solid ingredients derived from olive fruits.

Particularly vegetable oils, spreads, mayonnaises, salad dressings and sauces, in particular tomato sauces, may benefit from the invention. Particularly, the object of the present invention is to enrich food products with polyphenols from olive fruits.

15

#### SUMMARY OF THE INVENTION

It has been found that the solids of the olive fruit form a great resource of phenolic compounds. While the occurrence of those compounds in olive oil is about 200 ppm, in the water phase of olives it is 5000 ppm and in the solid remains even 10,000 ppm.

The invention is based on the finding that the solid matter of non-debittered olive fruits has appeared to be suited for enhancing the nutritional value of food products.

The aim of enhancing the nutritional value of a food product by fortification with useful olive fruit ingredients, is attained by incorporating into the food product solid matter derived from olives which solid matter has a particle size of 0.1  $\mu\text{m}$  - 5 mm, however, with the proviso that the used olives must not have been subjected to the usual debittering treatment.

Particularly, the invention provides a method to increase in food products the content of anti-oxidants, particularly the content of olive phenolics.

5 The invention further comprises a vegetable oil with a content of at least 180 ppm of olive phenolics, which oil comprises a dispersion of 0.05 - 0.5 wt.% of solid matter derived of olive fruit with a particle size of 0.1  $\mu$ m - 5 mm. At least 18 ppm of the olive phenolics is  
10 associated with said particles and is removed by filtration of the oil.

#### DESCRIPTION OF FIGURE

15 The graph of Figure 1 shows the relation of standard solutions of bitter oleuropein in refined olive oil and bitterness score. In this way it is possible to assess bitterness by comparison the taste of an oil with the taste of oleuropein solutions.

20

#### DETAILS OF THE INVENTION

25 The present invention uses solid matter derived from olive fruits. Such matter is chosen from the group consisting of 1. particles obtained by diminuting unprocessed olives, 2. the solids which settle at the bottom of tanks in which the oil resulting from olives  
30 pressing is stored and 3. particles of the cake which remains after pressing the liquid phase from olives. Said solid matter contains high concentrations of olive phenolics.

Preferably the kernels are left out from the solid matter. Suited for the present invention is only solid matter obtained from olives which have not been subjected to a debittering treatment.

5

Preferably, the solid olive matter is added to the food product in an amount of 0.05 - 0.5 wt.%, preferably 0.1 - 0.3 wt.%.

Wt.% is calculated as dry weight on total food product.

10

The olive derived solid matter can be obtained by simply cutting harvested olives in pieces, or by other well known methods for chopping and diminuting olive fruits. A high shear mixer, such as an Ultra-turrax™ can be

15 used for further reducing the size of the olive particles. Preferably, the particle size is such that the olive fruit solid matter does not settle when dispersed in a vegetable oil. The particle size suitably is in the range 0.1  $\mu\text{m}$  - 5 mm, preferably 0.1  $\mu\text{m}$  - 0.1  
20 mm.

For obtaining a fortified food product which normally contains a vegetable oil, that oil can suitably be replaced by a vegetable oil enriched according to the  
25 present invention.

According to one embodiment of the invention the olive solid matter is simply added as an ingredient of the final food product.

30

According to another embodiment of the invention the olive derived solid matter is allowed to soak in vegetable oil for at least one minute and then the solid matter is separated from the oil. A part of the useful

ingredients in the solid matter will dissolve during soaking and a part will remain associated with the solid particles.

Preferably, the soaking proceeds for at least 10 5 minutes, more preferably for at least one hour and even more preferably for at least one day. In a specific production process some trials will easily indicate which soaking time delivers the desired fortification. This separation embodiment is preferred only when a 10 clear product is desired. Together with the solid matter also those useful olive ingredients which are associated with that solid matter are removed.

The temperature of the oil during soaking the solid 15 matter is suitably kept at 30° - 300°C. Relatively low temperatures are preferred. Soaking with a heated oil will accelerate the fortification process and also may increase the final concentration of the beneficial ingredients of the olive fruits which have migrated into 20 the oil. The particles are removed preferably before the oil has cooled to ambient temperature. For removal one can use filtration, centrifugation or decantation.

The beneficial polyphenols known to be present in olive 25 fruits are a mixture of different compounds which share the property of having one or more phenolic hydroxyl groups. The main polyphenols originating from olive fruit comprise oleuropein, aglycon, tyrosol and hydroxytyrosol.

30

The food products fortified according to the present invention contain at least 10 ppm, preferably at least 50 ppm, more preferably at least 200 ppm of olive originating polyphenols.

According to another aspect of the present invention it is also possible to start with a blend of different types of olive fruits. A proper choice enables the adjustment of levels and types of beneficial olive ingredients, as well as of the taste of the obtained food products.

Olives harvested in the begin phase of their ripening are at their maximum polyphenols content. Use of those olives can enhance still further the fortification with phenolic compounds. Use of green olives usually gives the best results. The olive fruits may be processed directly after harvesting. But it is also possible to freeze-dry the olives and store them for later processing.

The present invention also comprises novel vegetable oils characterized by the presence of 0.05 - 0.5 wt.% of olive derived solid matter and at least 180 ppm of olive phenolic compounds. The oils of the present invention are characterized further in that an amount of at least 18 ppm of those phenolic compounds is associated with the solid matter. Association means that removal, e.g. by filtration, of the solid matter from the oil lowers the overall content of phenolics in the oil associated with those solids.

The substantial increase of beneficial components from the olive fruits, particularly an increase of polyphenols, results into a change of various oil properties such as the oxidation stability of the oil. The Rancimat<sup>TM</sup> test is a common and simple standard test for establishing the induction time which is a measure for the oxidation stability of edible oil.

As will be shown in the examples and contrary to expectation, addition of solid matter of non-debittered olive fruits in the claimed amounts to food products hardly or not deteriorates the taste. Particularly fortified olive oil exhibits a mild and often fruity, but hardly bitter aftertaste. Astringency, which is expected because of the increased content of phenolic compounds, is hardly noticed or only at high levels of phenolics. In olive oils not only a deterioration of the taste of the oil fails to turn up, often even an improvement of the taste may result. Possibly, the surprising impact on flavour may be ascribed, at least partially, to absorption of off-flavour causing components to the added solid matter of the olive.

Bitterness of olive oil can be assessed by comparing with standard solutions of the phenolic compound oleuropein. The bitterness of a solution of oleuropein in refined olive oil increases proportionally with concentration. The graph of figure 1 shows the relation of concentration and bitterness score. A bitterness score of 3 and higher is quite normal for a common non-refined olive oil which contains 180 ppm of olive polyphenols. It is surprising that the bitterness score of the invented oils is less than 3, although they contain at least 180 ppm of olive oil polyphenols.

The bitterness score of a common non-refined olive oil with a polyphenols content surpassing 300 ppm is at least 5.

The invention provides novel vegetable oils including olive oil which contain 0.05 - 0.5 wt.% of olive fruit derived solid matter, have a polyphenols concentration

of at least 300 ppm, but, nevertheless, exhibit a bitterness score which is less than 5.

The invented method is suitable for fortifying vegetable  
5 oils such as rapeseed oil, sunflower seed oil, soybean  
oil, corn oil and, preferably, olive oil, which contain  
or not contain any amount of native polyphenols. Olive  
oil is comprised in all its quality grades: extra virgin  
olive oil, fine virgin olive oil, semi-fine or regular  
10 virgin olive oil, refined virgin olive oil, such as  
Lampante oil, olive residue oil and also olive oil  
blends, which contain virgin olive oil as well as  
refined olive oil. It should be noted that the solid  
olive matter to be used in the invention consists of  
15 natural olive ingredients.

It goes without saying that the invention also might be  
advantageous for the fortification of fat blends which  
partly consist of fat derived from animals or marine  
20 organisms.

The method of the invention is further applicable for  
the fortification of food products different from fat  
and oils, such as spreads, salad dressings, mayonnaise  
25 or a sauces.

In the present context spreads are understood to be food  
compositions which usually contain a substantial amount  
of fat emulsified with a water phase and which have a  
plastic consistency suitable for spreading on bread.  
30 Usually the fat phase consists of a liquid oil and a  
structuring fat which gives the spread its desired  
plastic consistency.



Sauces include any type of sauce, such as sauces that are ready to use and tomato sauces. Processes for the manufacture of spreads and sauces are well known in the art and need no illustration.

5

Although the present invention relates to methods which use solid matter of olive fruits which are non-debittered, for culinary purposes debittered olives may be used in addition when preparing the products covered  
10 by the present invention.

For establishing polyphenol concentrations in the products of the present patent specification the colorimetric Gutfinger method has been used. Since long  
15 the content of polyphenols in olive oils is established by this standard method. It is described in J.Am.Oil.Chem.Soc. 1981, 11, pp. 966-968. The measurement is based on the reaction of a methanolic extract of olive oil and the Folin-Ciocalteu reagent.

20

Unless specified otherwise, the weight percentages of the solid matter particles throughout this specification are calculated as dry weight on total food product.

25 In this specification the term fat comprises oil as well. The term oil is generally used when the fat is liquid at ambient temperature.

30 The invention is illustrated by the following examples.

**GENERAL****RANCIMAT™ TEST**

5

Through the heated oil of which the oxidation stability is to be tested air is bubbled. The Rancimat™ value is the induction time, the maximum time during which no off-flavours can be smelled in the air which has passed 10 through the oil.

**EXAMPLE 1**

Two types of Italian olives of which the kernel had been 15 removed, were chopped by means of an Ultra-turrax™ until a particle size of 100 µm. The chopped olives were added to a French and to a Greek extra-virgin olive oil. After 24 hours of soaking the obtained turbid oils were assessed on taste. The polyphenol content and the 20 induction time were measured. See Tables I - IV for results.

**EXAMPLE 2**

25 This example was carried out in the same way as example 1, with the exception that freeze dried olives were chopped before addition to the oil and that small particles are compared with larger particles. From the figures in Tables V and VI it appears that a 30 freeze drying treatment enhances the migration of phenolic compounds into the oil. The same effect is obtained when smaller particles are used.

TABLE I

ITALIAN OLIVES TYPE 1 SOAKED IN FRENCH EXTRA VIRGIN OLIVE OIL			
olives added wt. %	PP ppm (1)	IT hours (2)	bitter score taste of the mixture
0 (ref)	158	7.12	2, mild and fruity
0.4	175	6.13	not assessed
0.5	187	6.05	2, less fruity, little aftertaste
0.67	235	-	2, bit fruity, mild aftertaste

5

(1) PP= total polyphenol content (ppm)

(2) IT= induction time (hours)

TABLE II

ITALIAN OLIVES TYPE 2			
IN FRENCH EXTRA VIRGIN OLIVE OIL			
olives added wt. %	PP ppm (1)	IT hours (2)	bitterness score taste of the mixture
0 (ref.)	158	7.12	2, mild and fruity
0.4	186	7.20	not assessed
0.5	203	7.68	2, stronger taste, less fruity

5

TABLE III

ITALIAN OLIVES TYPE 1			
IN GREEK EXTRA VIRGIN OLIVE OIL			
olives added wt. %	PP ppm (1)	IT hours (2)	bitterness score taste of the mixture
0 ref	147	3.00	2, bit fruity, strong taste
0.4	155	3.18	not assessed
0.5	183	3.82	2, not bitter, bit stronger

(1) PP= total polyphenol content (ppm)

(2) IT= induction time (hours)

TABLE IV

ITALIAN OLIVES TYPE 2 IN GREEK EXTRA VIRGIN OLIVE OIL			
Olives added wt. %	PP (pp) (1)	IT hours (2)	Bitterness score, Taste of the mixture
0 ref	147	3.00	2, bit fruity strong taste
0.4	153	3.15	not assessed
0.5	181	3.70	2, little astringency, little aftertaste

5 (1) PP= total polyphenol content (ppm)

(2) IT= induction time (hours)

TABLE V

ITALIAN OLIVES TYPE 2			
IN GREEK EXTRA VIRGIN OLIVE OIL			
olives added <sup>1</sup>	PP (ppm)	IT hours	bitterness score, taste of the mixture
0	145	3.00	2, little aftertaste
2.5	320	4.68	3, mild, bit fruity

<sup>1</sup> Wt.% big particles, particle size approximately 1 mm.

5

TABLE VI

ITALIAN OLIVES TYPE 1			
IN GREEK EXTRA VIRGIN OLIVE OIL			
olives added <sup>2</sup>	PP (ppm)	IT hours	bitterness score, taste of the mixture
0	145	3.00	2, little aftertaste
2.5	532	6.72	3, mild, not bitter

<sup>2</sup> Wt.% small particles, size approximately 50 µm.

10

08. 01. 2001

## C L A I M S

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1. Vegetable oil which contains at least 180 ppm of olive phenolics, characterized in that the oil comprises a dispersion of 0.05 - 0.5 wt.% of solid matter derived of olive fruit with a particle size of 0.1  $\mu$ m - 5 mm and in that at least 18 ppm of the olive phenolics is associated with said particles.
2. Vegetable oil according to claim 1, characterized in that the amount of olive derived solid matter is chosen such that a bitterness score of less than 3 results, where bitterness is assessed by comparison with standard oleuropein solutions using the graph of figure 1.
3. Vegetable oil according to claim 1, characterized in that the amount of olive derived solid matter is chosen such that a phenolics content of at least 300 ppm and a bitterness score of less than 5 results, where bitterness is assessed by comparison with standard oleuropein solutions using the graph of figure 1.
4. Method of fortifying a food product with phenolic compounds by incorporating in the food product solid matter derived from olives which have not been subjected to a debittering treatment, which solid matter has a particle size of 0.1  $\mu$ m - 5 mm, characterized in that the olives derived solid matter is added to the food product in an amount of 0.05 - 0.5 wt.%, preferably 0.1 - 0.3 wt.%.
5. Method according to claim 4, whereby the solid matter is chosen from the group consisting of 1. particles of unprocessed olives, 2. the solids which settle at the bottom of tanks in which the oil resulting from olives pressing is stored and 3. particles of the cake which remains after pressing the liquid phase from olives.
6. Method according to claims 4 or 5, whereby the obtained food product contains at least 10 ppm of olive derived phenolic

F7480 cpl (V)

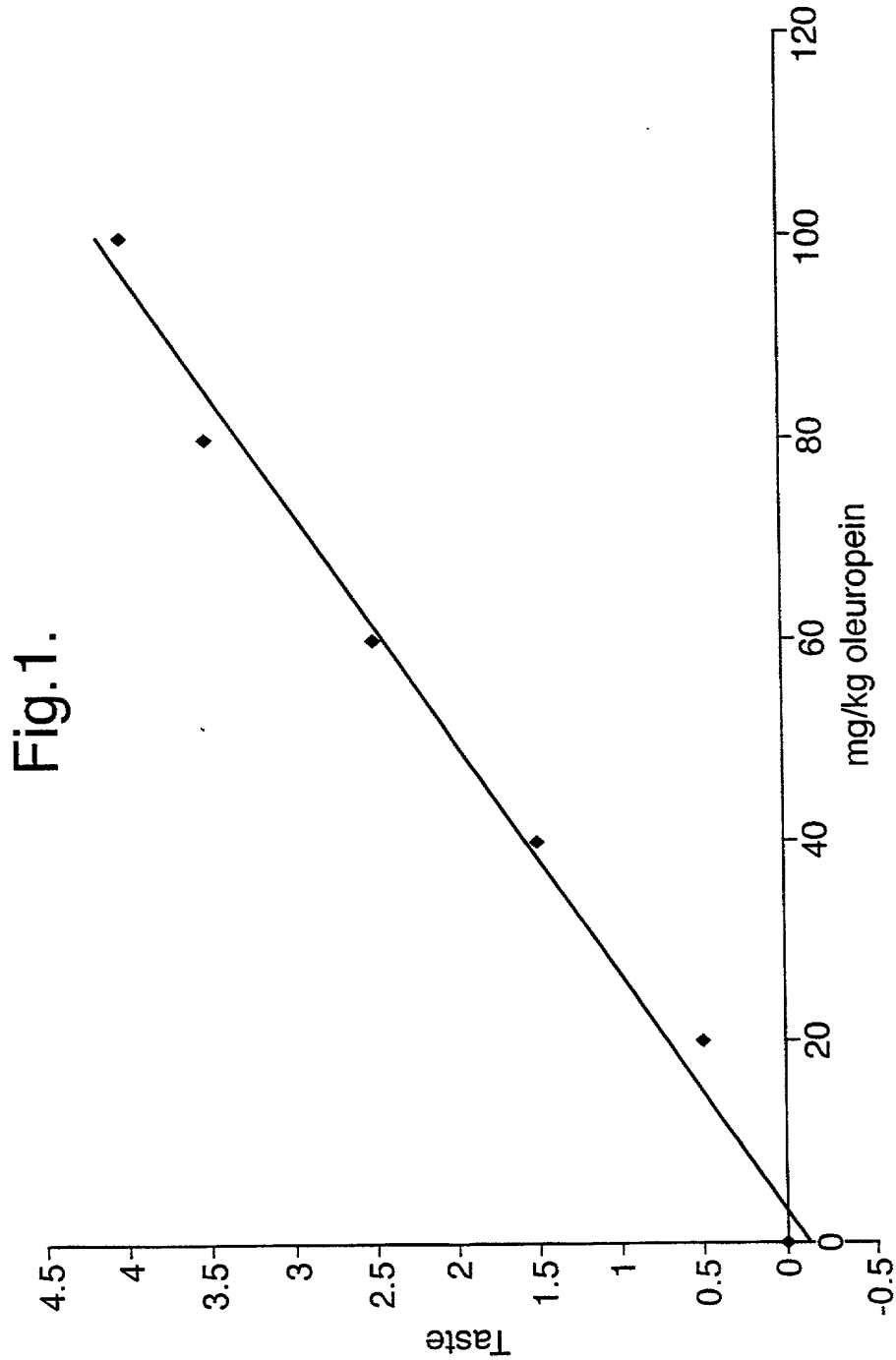
Amended 7 December 2000

compounds.

7. Method according to any one of claims 4 - 6, whereby the food product is a vegetable oil, preferably an olive oil.
8. Method according to claim 8, whereby the olive solid matter is allowed to soak in the oil for at least one minute and then is separated from the oil.
9. Method according to any one of claims 4 - 6, whereby the food product is chosen from the group consisting of a spread, a salad dressing, mayonnaise or a sauce.
10. Food product obtainable by the method according to any one of claims 4 - 9.
11. Food product prepared with the oil obtainable by the method according to claims 7 or 8.



1/1



COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (Includes Reference to PCT International Applications)			Attorney Docket No. F7480 (V)
<p>As a below named inventor, I hereby declare that:</p> <p>My residence, post office address and citizenship are as stated below next to my name.</p> <p>I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:</p> <p><b>FORTIFICATION OF FOOD PRODUCTS WITH OLIVE FRUIT INGREDIENTS</b></p> <p>the specification of which (check only one item below):</p> <p><input type="checkbox"/> is attached hereto.</p> <p><input type="checkbox"/> was filed as United States application Serial No. 09/ _____ on _____ and was amended on _____ (if applicable)</p> <p><input checked="" type="checkbox"/> was filed as PCT international application PCT/EP99/09571 on 06 Dec 1999 and was amended under PCT Article 19 on _____ (if applicable)</p> <p>I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.</p> <p>I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).</p> <p>I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:</p>			
<b>PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. 119:</b>			
COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. 119
EUROPE	98204441.4	23 Dec 1998	YES

I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code §112. I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations §1.56(a) which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application.

**PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120.**

U.S. APPLICATIONS		STATUS (CHECK ONE)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED

PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S SERIAL NUMBERS ASSIGNED (if any)		
PCT/EP99/09571	06 Dec 1999			

**POWER OF ATTORNEY:** As a named inventor, I hereby appoint the following attorney(s) and/or agents(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

CUSTOMER NUMBER: 000201Direct all correspondence to: CUSTOMER NUMBER 000201

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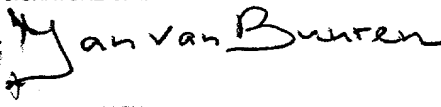
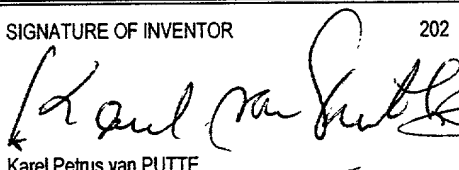
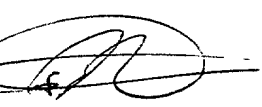
202

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

SIGNATURE OF INVENTOR  Jan van BUUREN	SIGNATURE OF INVENTOR  Karel Petrus van PUTTE	SIGNATURE OF INVENTOR  Nicolaas OVERBEEKE
DATE	DATE	DATE